

Fig. 1(a)

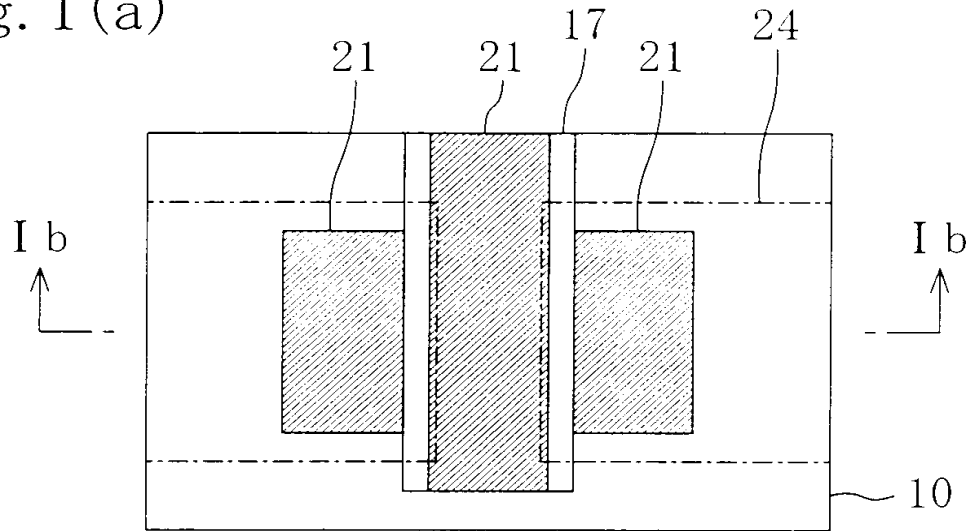


Fig. 1(b)

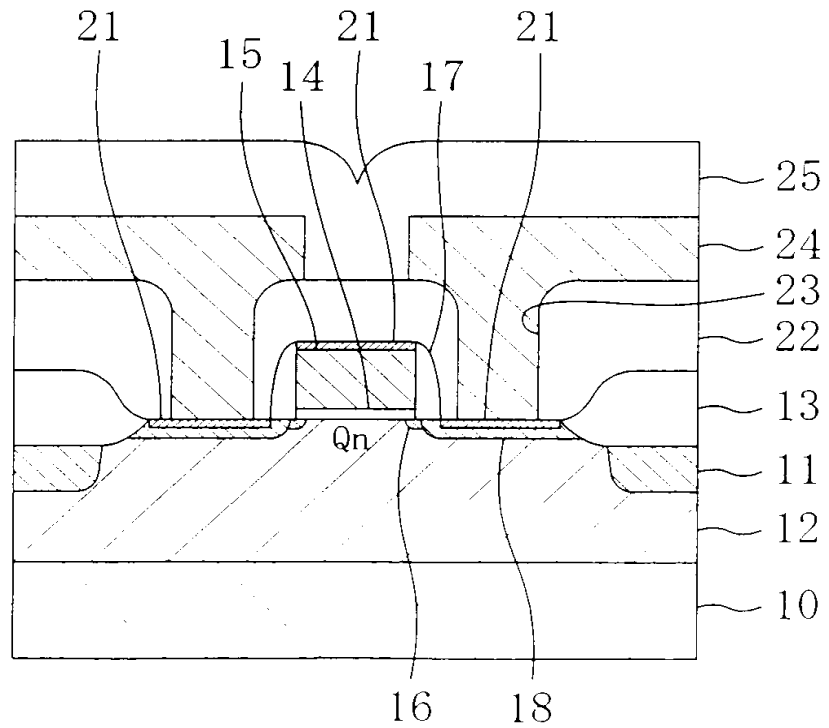


Fig. 2(a)

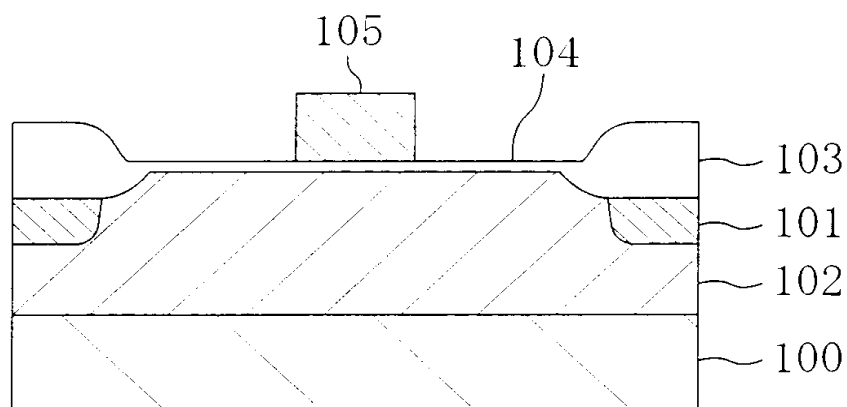


Fig. 2(b)

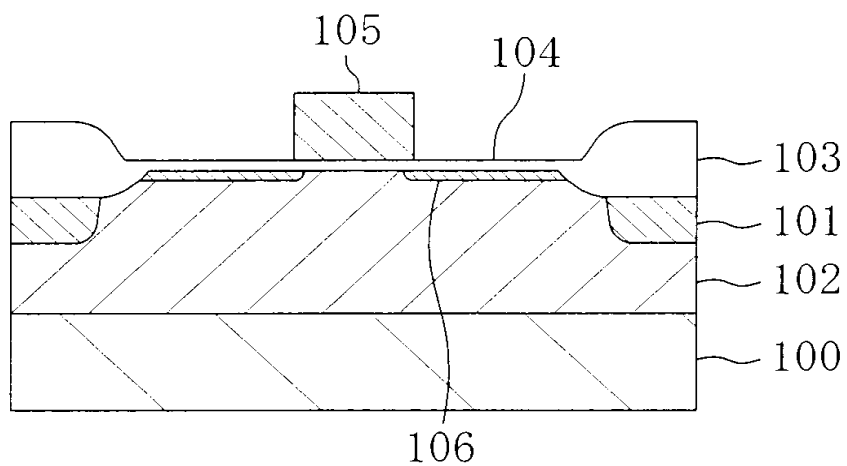


Fig. 2(c)

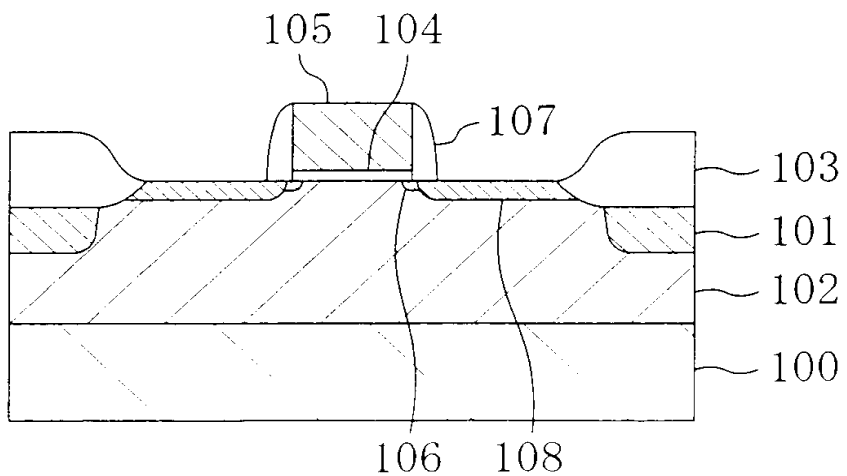


Fig. 3(a)

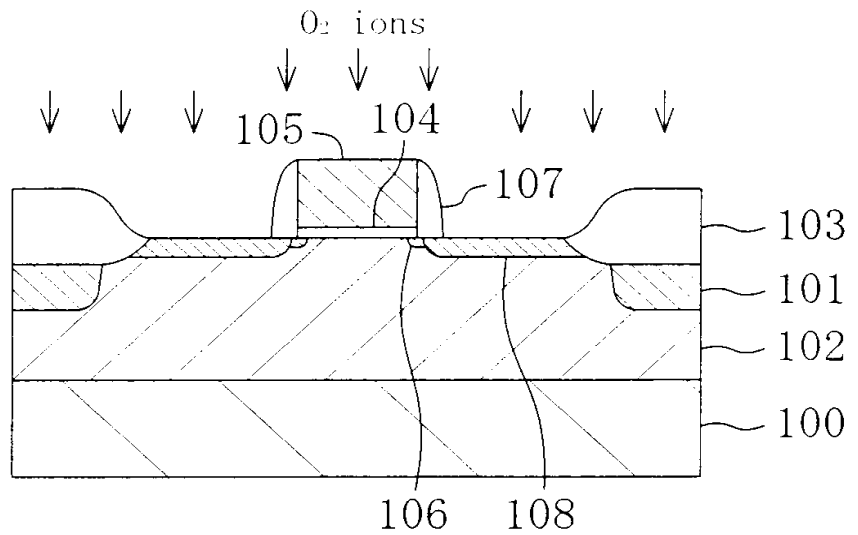


Fig. 3(b)

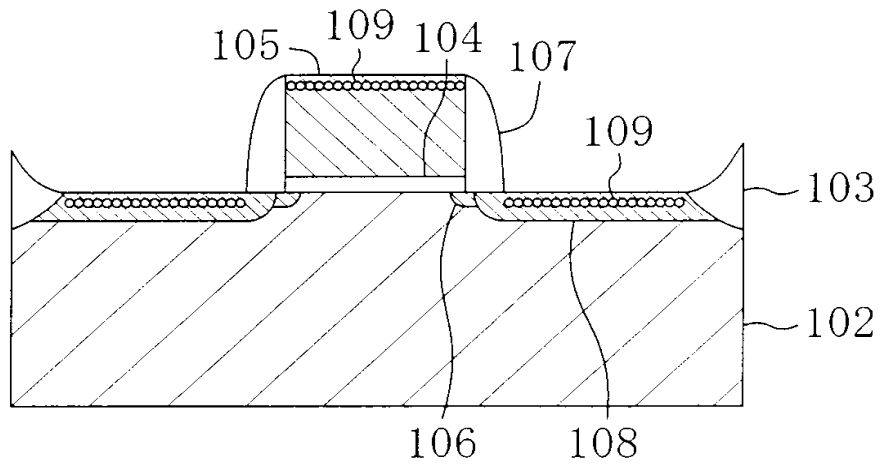
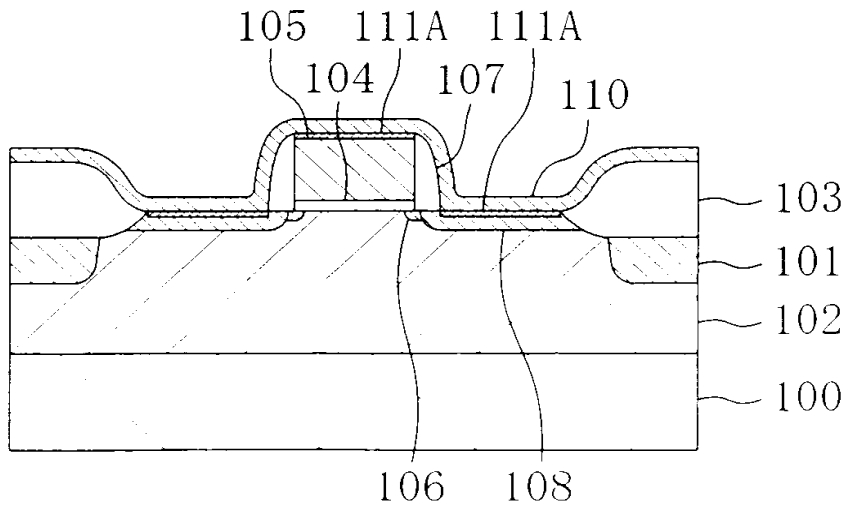


Fig. 3(c)





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Fig. 5(a)

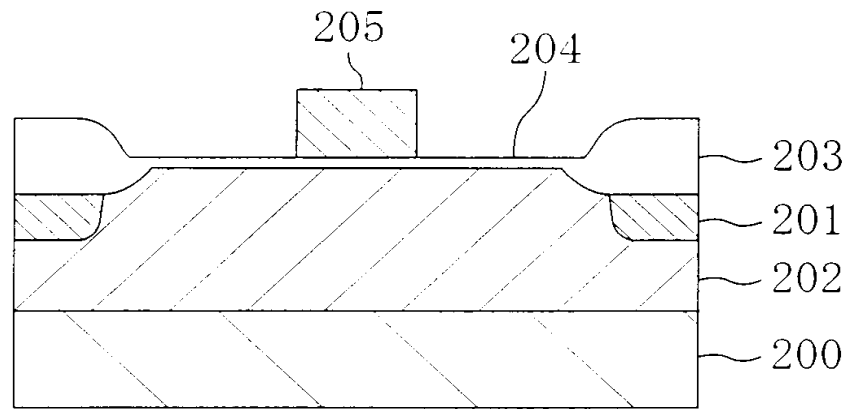


Fig. 5(b)

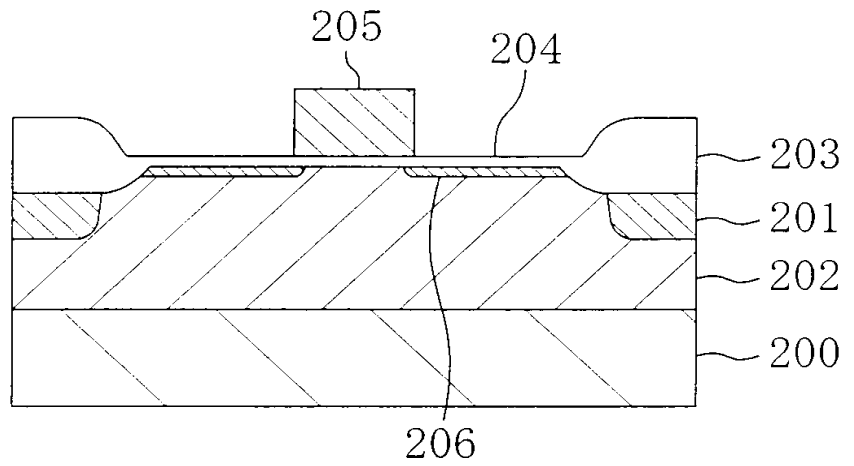
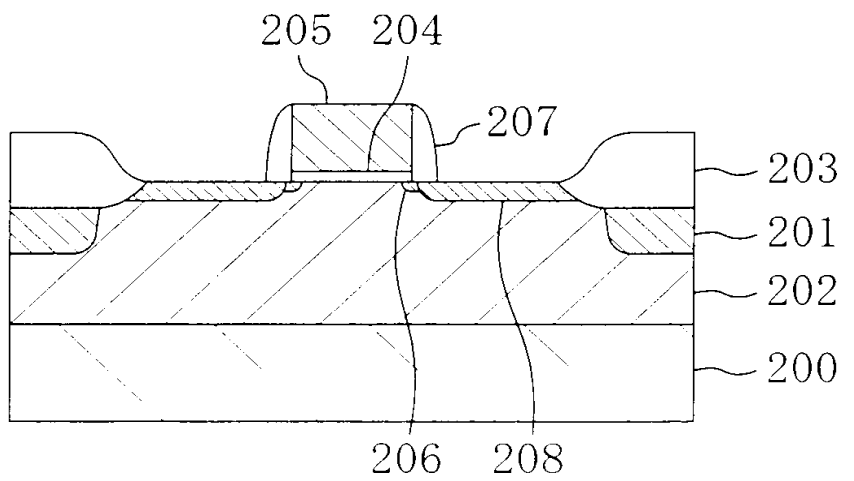


Fig. 5(c)



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Fig. 6(a)

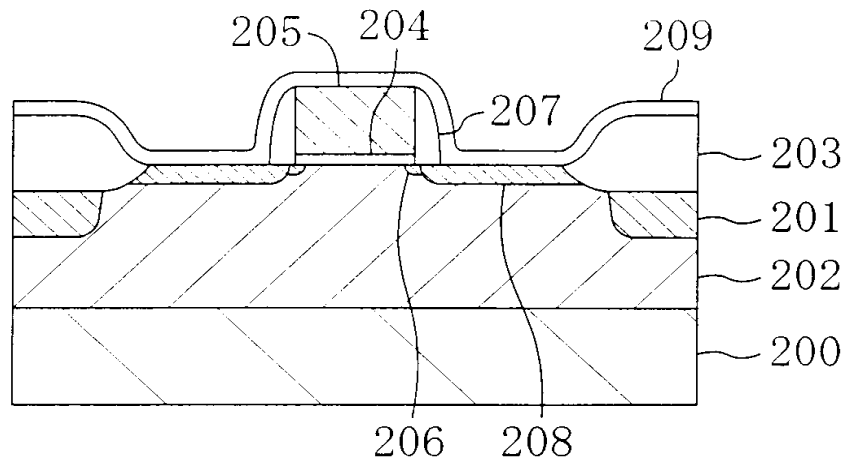


Fig. 6(b)

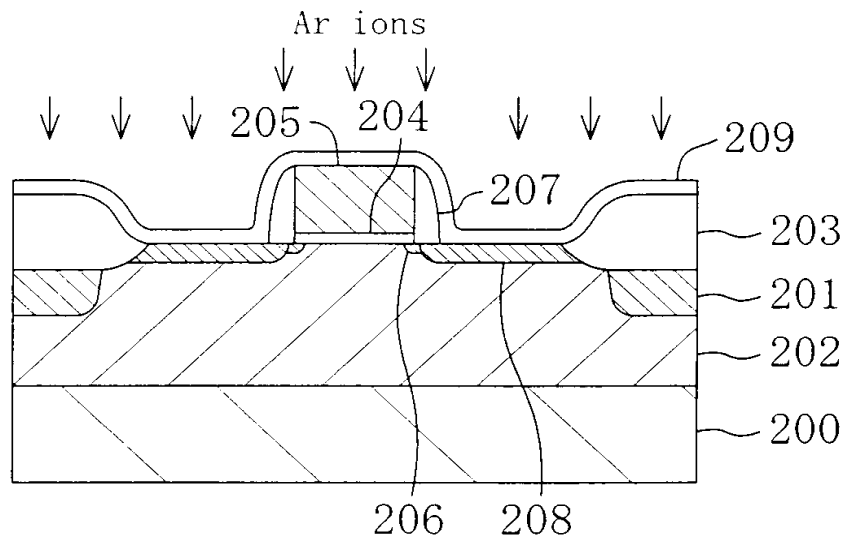
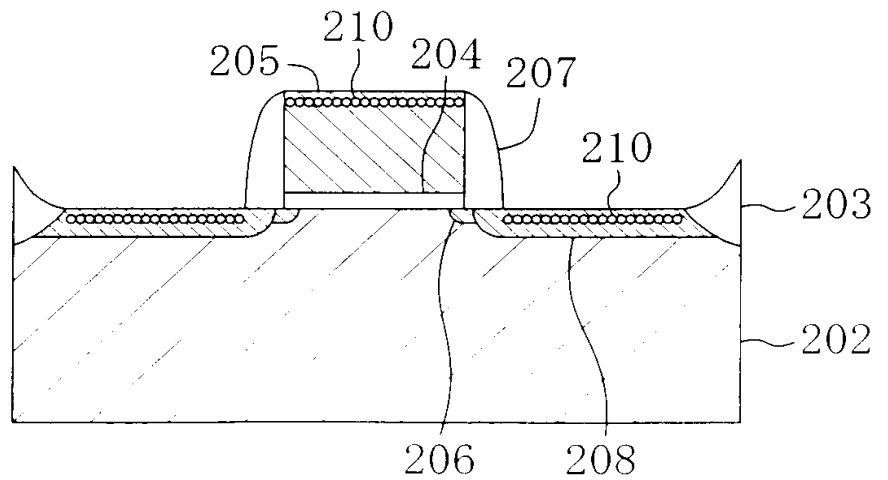


Fig. 6(c)



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Fig. 7(a)

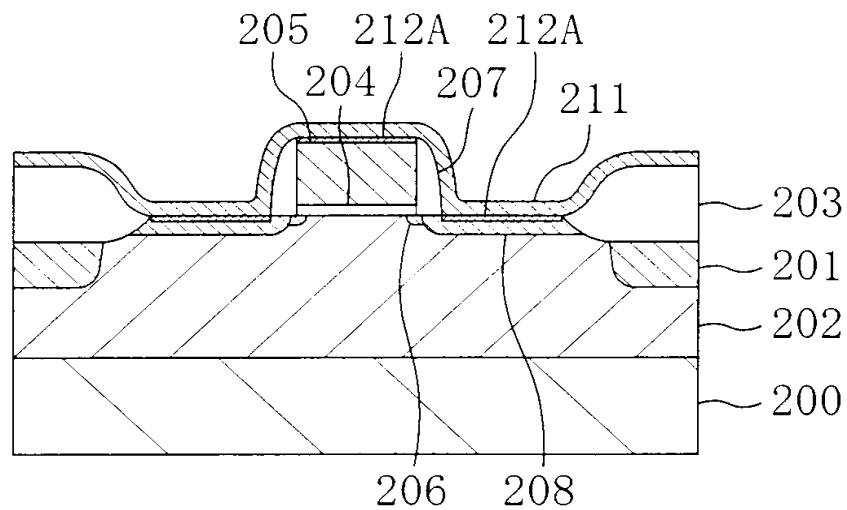
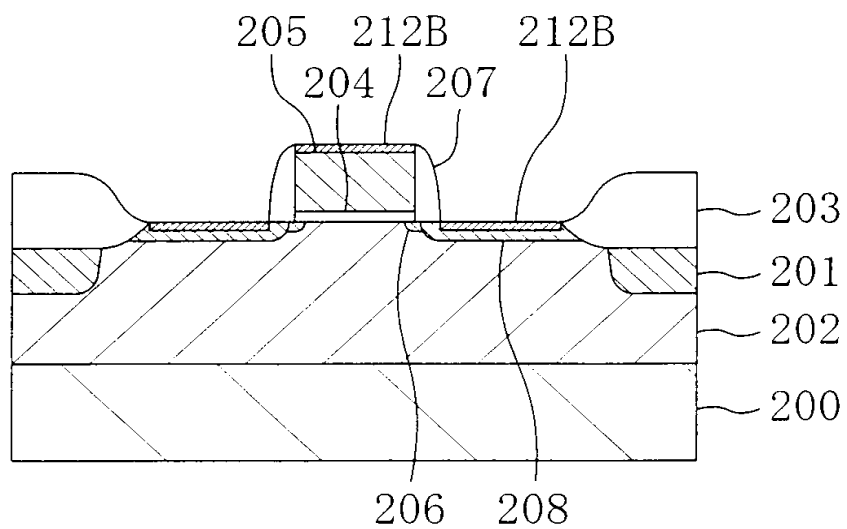
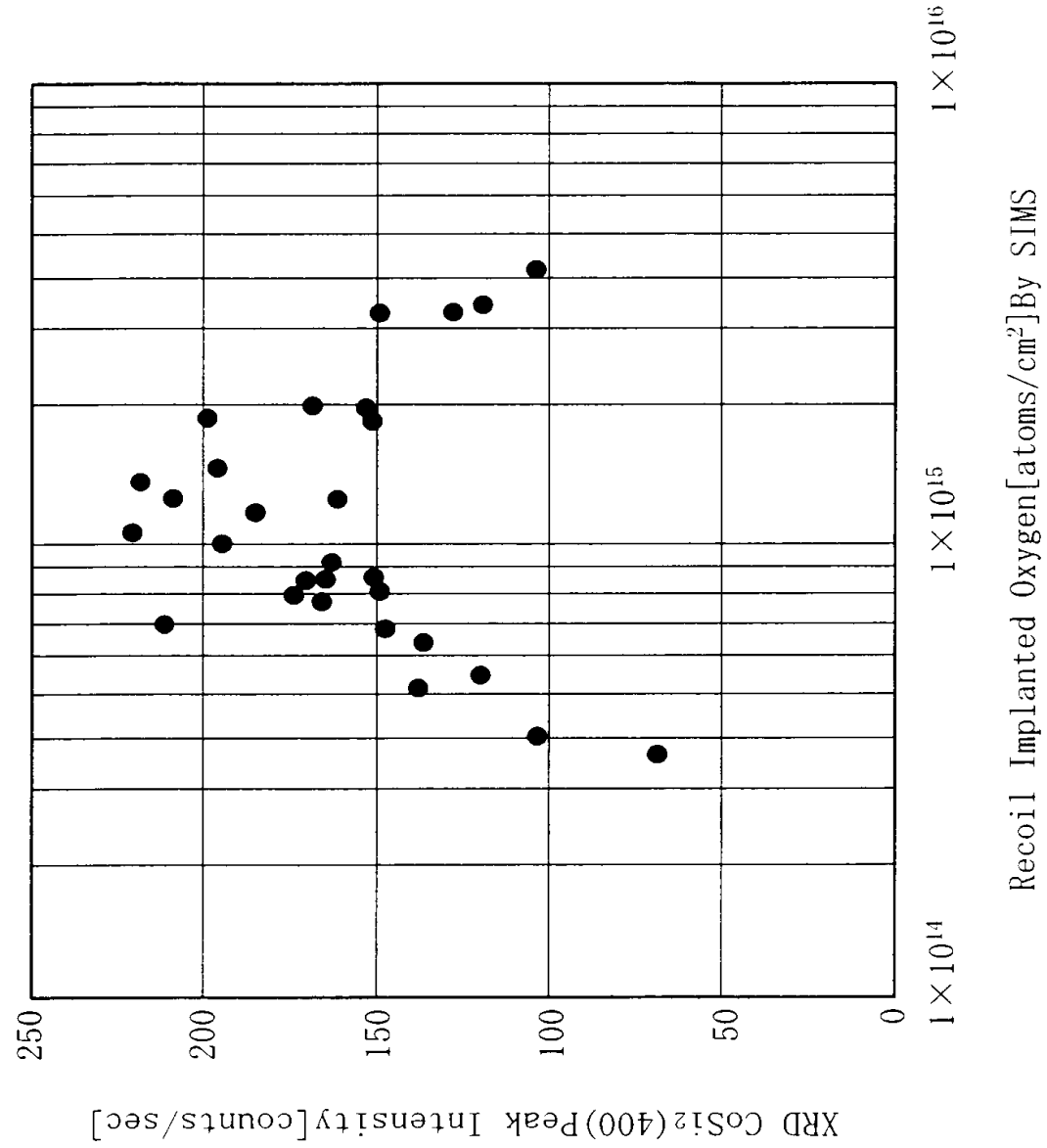


Fig. 7(b)



"FIG. 7(a)"

Fig. 8





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# A Method for Fabricating a Semiconductor Device

2003/07/21

740819 - 559

P23427 - 06

Matsushita Electric

The object of this invention

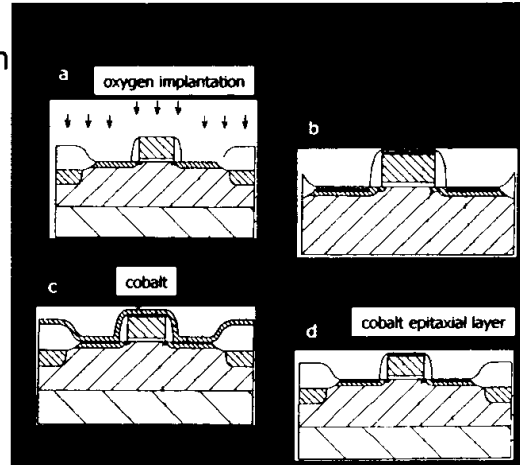
## objective

<High Property for transistor>

- Epitaxial Cobalt silicide formation on a source and drain region

## Effect

- Low resistivity for source and drain region
- Thick CoSi<sub>2</sub> layer



The point of this invention

A non-metal element such as oxygen, nitrogen, and fluorine distributed layer is used for forming a silicide layer.

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# This Invention vs Cited Reference

2003/07/21

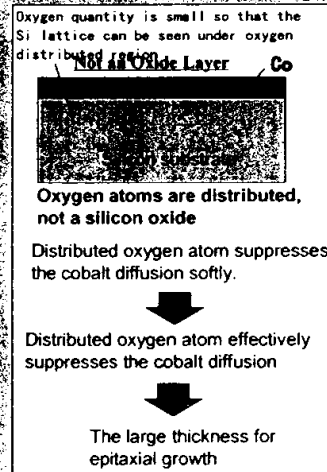
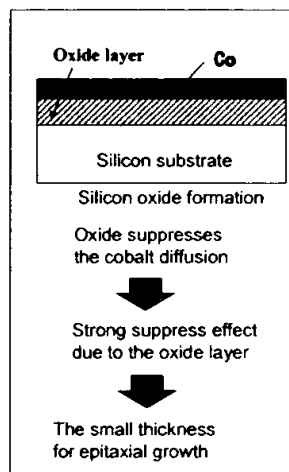
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USP 728625

Invention



An oxygen distributed layer is used for forming a cobalt silicide.  
Oxide layer is NOT used to form a cobalt silicide layer in this invention.

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## This Invention vs Cited Reference

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USP 330775

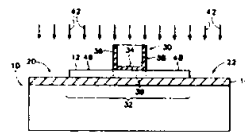
Invention

2003/07/21

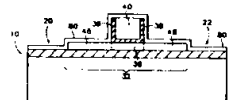
740819 - 559

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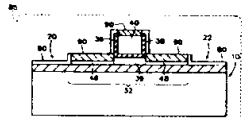
Matsushita Electric



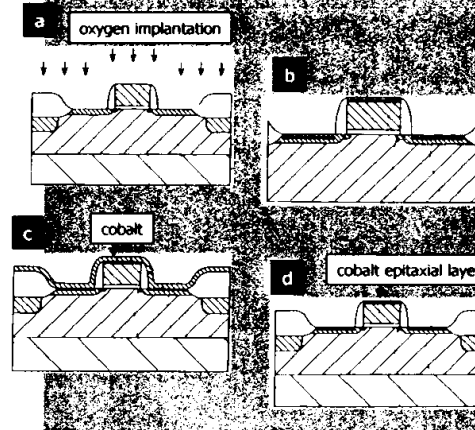
Implantation for S/D



Metal layer deposition



Forming a silicide layer



For this invention, oxygen implantation is not to form a source and a drain region, but a oxygen distributed layer to form an epitaxial silicide layer.

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## Claim Amendment

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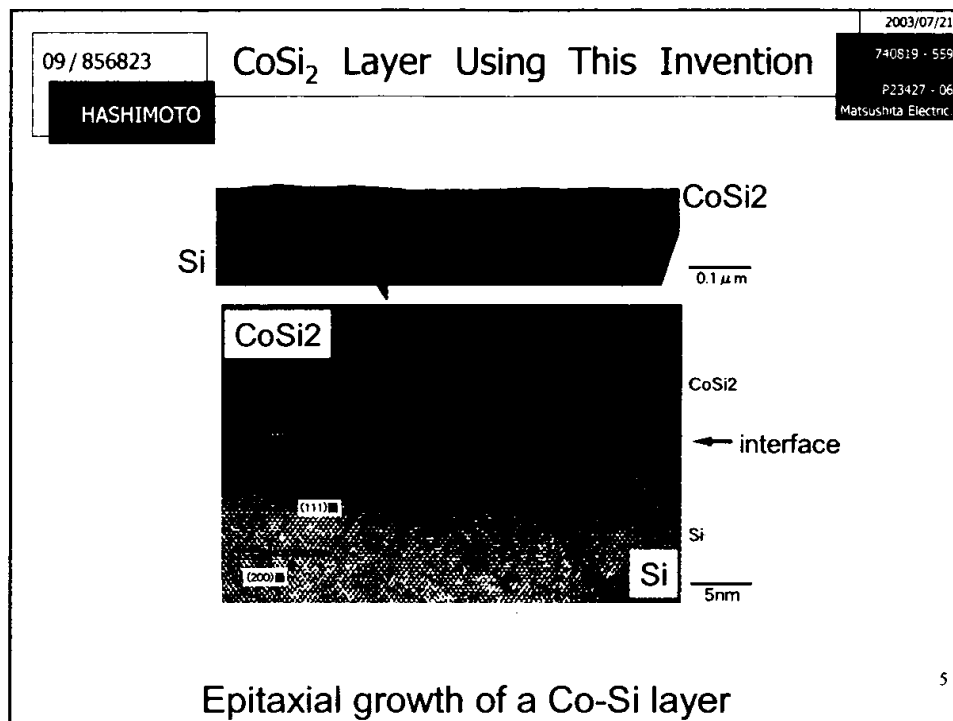
1. A method for fabricating a semiconductor device comprising the steps of:

distributing a nonmetal element composed of oxygen element, nitrogen element, and fluorine element in a region in the vicinity of a surface portion of a semiconductor layer;

depositing a metal film on said semiconductor layer; and

epitaxially growing a semiconductor-metal compound layer in the surface portion of said semiconductor layer by causing a reaction between an element included in said semiconductor layer and a metal included in said metal film through annealing carried out on said metal film.

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09/856823	<b>Policy for a claim amendment</b>	2003/07/21 740819 - 559 P23427 - 06 Matsushita Electric
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The words "nonmetal element" in the claims are limited to oxygen, nitrogen, and fluorine.

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## CoSi<sub>2</sub> Layer Using This Invention

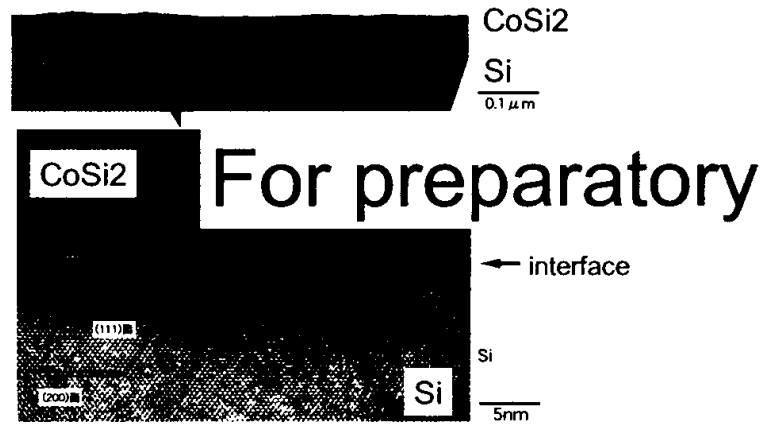
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### Epitaxial growth of a Co-Si layer



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